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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,266	09/16/2003	John Kevin Rote	TI-35799	1448

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EXAMINER

HABERMEHL, JAMES LEE

ART UNIT	PAPER NUMBER
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2651

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,266

Applicant(s)

ROTE ET AL.

Examiner

James L. Habermehl

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 2-7 and 9-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-22 is/are allowed.
- 6) ☒ Claim(s) 2-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. This Office action is in response to amendment filed 20 February 2006, which papers have been placed of record in the file.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 2-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Soldavini et al. Soldavini et al. meets all the limitations of claim 4, including sampling actuator voltage ($V_i(t)$ input to 205), processing the sample for generating a digital voltage command (203), and applying the digital voltage command to control the actuator voltage (201).

Regarding claim 2, Soldavini et al. converts an analog actuator voltage into a digital actuator voltage sample signal (inherent to a digital implementation of the whole voltage-mode driver circuit [0047]).

Regarding claim 3, Soldavini et al. converts the digital voltage command into an analog voltage level (301).

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 2-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brito et al. in view of Soldavini et al. Brito et al. Figures 3-5 meet all the limitations of claim 4, including sampling actuator voltage (164), processing the sample for generating a digital voltage command (150), and applying the digital voltage command to control the actuator voltage (154), except it does not show the step of applying the digital voltage command to control the actuator voltage further comprises using pulse width modulation. Notably Brito et al. shows in Figures 2 and 4 using a voltage controlled VCM actuator using linear amplifier 156 instead of a current controlled VCM actuator using linear amplifier 108.

Soldavini et al. Figure 3 and paragraphs 0045-0046 show in the same art of voltage controlled VCM actuators using a voltage control amplifier comprising a switched power driver circuit 301 controlled by a pulse width modulation circuit 303, and that using switched-mode amplifiers and linear amplifiers are equivalents known in the art of voltage controlled VCM actuators. Therefore it would have been obvious to one of ordinary skill in the art to apply the digital voltage command to control the actuator voltage using pulse width modulation controlling

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a switched-mode amplifier instead of using a linear amplifier because these two voltage amplifiers were art-recognized equivalents at the time the invention was made.

Regarding claim 2, Brito et al. converts an analog actuator voltage into a digital actuator voltage sample signal (258/266/268).

Regarding claim 3, Brito et al. converts the digital voltage command into an analog voltage level (276/282).

Regarding claim 5, Brito et al. puts the actuator in a high impedance state (Figure 3 and FLOAT), waits for an actuator current to reach approximately zero (Figure 3 and 272), and thereafter samples the actuator voltage (Figure 3 and SAMPLE).

Regarding claim 6, Brito et al. calculates a velocity error and applies velocity error compensation to the digital voltage command (144).

Regarding claim 7, Brito et al. shows subsequent to the applying step, waiting for a selected time and reiterating the sampling, processing, and applying steps (Figure 3 and 166).

6. Claims 9-22 are allowed over the prior art of record. The following is a statement of reasons for the indication of allowable subject matter:

Claim 11 is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a method of controlling the actuator in a hard drive assembly comprising the digital voltage command is described by the formula as claimed, as presented in the environment of claim 11. It is noted that the closest prior art, Abe et al., shows a similar method of controlling the actuator in a hard drive assembly. However, Abe et al. fails to disclose the digital voltage command is described by the formula as claimed.

Claim 13 is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a velocity-controlled actuator in a hard drive assembly comprising a digital processing engine for receiving a target actuator voltage command and the digital actuator motor voltage sample and for outputting a digital voltage command for controlling the actuator motor, as presented in the environment of claim 13. It is noted that the closest prior art, Brito et al., shows velocity-controlling the actuator by sampling the actuator voltage, processing the sample for generating a digital voltage command, and applying the digital voltage command to control the actuator voltage. However, Brito et al. fails to disclose a digital processing engine as claimed.

Response to Arguments

7. Applicant's arguments filed 20 February 2006 have been fully considered but they are not persuasive.

Regarding applicant's argument that Soldavini does not show applying the digital voltage command to control the actuator voltage using pulse width modulation because the pulse width modulation is not seen in this reference (applicant's response, p. 7), the examiner responds that element 303 and paragraph 0045 show applying the digital voltage command to control the actuator voltage using pulse width modulation.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

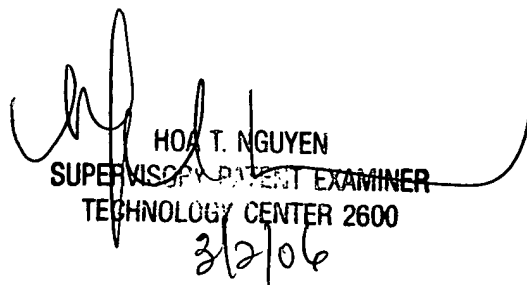
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James L. Habermehl whose telephone number is (571)272-7556. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on (571)272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Habermehl/jlh
27 Feb 06



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